REMARKS

This Amendment is responsive to the Office Action mailed June 14, 2006 in connection with the above-identified patent application. In that Action, claims 1-18 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter. Also in that Action, claims 1-2, 14-16, and 18 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,665,684 to Zait et al. Further in that Action, claims 3-6, 8-9, and 11-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Zait et al. in view of U.S. Patent No. 6,965,891 to Jakobsson et al. Still further in that Action, claims 7 and 10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Zait et al. in view of Jakobsson et al. and further in view of U.S. Patent No. 5,664,172 to Antoshenkov. Yet further in that Action, claims 13, 17, and 19-20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Zait et al. in view of U.S. Patent No. 6,014,656 to Hallmark et al.

THE NON-ART REJECTIONS

As noted above, claims 1-18 were rejected under 35 U.S.C. §101 as being as being directed to non-statutory subject matter. The examiner took the position that the claimed subject matter fails to produce a result that is limited to having a real world value. He further states that, though a database query us being processed against the database fragments, nothing is being done with the processing and that there is neither a useful or tangible result of the processing.

In response to the stated reasons for the 35 U.S.C. §101 rejections, although applicant respectfully disagrees with the stated reasons and does not concede that the Examiner's position is correct, applicant has amended each of independent claims 1 and 14 for purposes of advancing prosecution and clarifying the claims only and not for reasons of patentability. The amendments show that a query result is being produced by the processing for a user of the database.

More specifically, independent claim 1, as amended, now recites "processing a

database query against the database fragments of the database <u>based on the boolean</u> <u>combination of comparison-predicates; and providing results of the processing to a user</u> <u>of the database</u>." Claim 1 shows the usefulness of the claimed subject matter (processing a database query against the database fragments of the database) and which clearly shows that a tangible result is recited (providing results of the processing to a user of the database).

Similarly, independent claim 14, as amended, now recites "<u>enabling improved</u> <u>query efficiency by utilization of fragment elimination based on the fragmentation</u> <u>scheme during query processing which produces query results for a user of the</u> <u>database</u>." This likewise reinforces the usefulness and tangible result of the claimed subject matter.

For the above-stated reasons, applicant submits that independent claims 1 and 14, as amended, and claims 2-13 and 15-18 dependent respectively therefrom are directed to statutory subject matter.

THE ART REJECTIONS

As noted above, claims 1-2, 14-16, and 18 were rejected under 35 U.S.C. §102(e), and claims 3-13, 17, and 19-20 were rejected under 35 U.S.C. §103(a). Those rejections are respectfully traversed as set out in detail below.

<u>Claims are patentable over Zait et al.:</u>

Claims 1-2, 14-16, and 18 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,665,684 to Zait et al. ("the Zait '684 patent").

The Office action asserts that the Zait '684 patent teaches fragmenting a database into a plurality of database fragments using a plurality of fragmentation expressions, each fragmentation expression corresponding to a database fragment and including a boolean combination of one or more comparison-predicates wherein each comparison-predicate defines a range of a fragmentation dimension basis function of

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one or more database fields, with reference to col. 1, lines 38-67 of the Zait '684 patent. Applicant respectfully traverses this interpretation of the Zait '684 patent because it is incorrect and the 35 U.S.C. §102(e) rejection of the subject claims for the following reasons.

First, applicant notes that the Zait '684 patent teaches composite partitioning which utilizes either hash-based partitioning or range-based partitioning (col. 4, lines 11-38). Both hash-based and range-based partitioning are well known in the art. As described in the Zait '684 patent itself: "According to hash partitioning, one or more values from each record are applied to a hash function to produce a hash value. A separate partition is established for each possible hash value produced by the hash function, and rows that hash to a particular value are stored within the partition that is associated with that hash value" (col. 2, lines 42-59); and "With range partitioning, each individual partition corresponds to a particular range of values for one or more columns of the table. For example, one column of a table may store date values that fall within a particular year, and the table may be divided into twelve partitions, each of which corresponds to a month of that year." (col. 1, lines 24-29). Applicant submits that the fragmentation techniques recited in independent claims 1 and 14 of the present application are novel and patentably distinct over the partitioning techniques described in the Zait '684 patent.

In rejecting claims 1 and 14, it is possible in the Examiner's interpretation that some confusion may have arisen from the use of the term "range" in the limitations of claims 1 and 14. For example the phrase "comparison-predicate defines a range of a fragmentation dimension basis function of one or more database fields" as recited in claim 1, and similarly in claim 14 may be an inadvertent source for confusion. Unlike the range-based partitioning described in the Zait '684 patent where a partition corresponds to a range of values of a column (database field), the claims here are using the term "range" in reference to defining a range of output values of a basis function which uses the database field as an input value (domain). As described in paragraph

25 of the present application, "It will be recognized that each comparison predicate represents a one dimensional range of the corresponding fragmentation dimension basis function. Thus, the comparison predicate f1>k1 is equivalent to the range (k1,∞); the comparison predicate f1<k2 is equivalent to the range (−∞,k2); and the comparison predicate f1>k3 is equivalent to the range [k3,∞)." In the quoted text of paragraph 25, the term f1 represents the output value of the basis function. Thus, the recited comparison-predicate determines the fragment (or partition) based on the output value of a basis function, rather than on the value of a database field (or column) as described in the Zait '684 patent. The Office Action does not show where the Zait '684 patent either teaches or fairly suggests the recited features relating to comparison-predicates and basis functions as recited in each of independent claims 1 and 14, as amended. In particular, applicant notes that the only function described in the Zait '684 patent is a hash function which is entirely different than the basis function recited in claims 1 and 14, as amended. The Zait '684 patent recites the phrase "partitioning function" in the claims, however, the recited phrase appears to have questionable antecedent basis and appears not to be defined anywhere in the specification.

Further, however, each of independent claims 1 and 14 also recites a limitation for a boolean combination of one or more comparison predicates, even further distinguishing the subject claims over the Zait '684 patent. The Office Action has also not shown where the Zait '684 patent teaches or fairly suggests this feature of a boolean combination as recited in claims 1 and 14, as amended.

Thus, for at least the above reasons, it is respectfully submitted that independent claims 1 and 14, and claims 2, 15-16 and 18 dependent therefrom, as amended, are not anticipated by U.S. Patent No. 6,665,684. The Office Action has not demonstrated in the record that each and every claim limitation element of the subject claims, as amended, is taught in the Zait '684 patent.

It is respectfully submitted, therefore, that claims 1-2, 14-16, and 18, as amended, are not anticipated by Zait et al. and are in condition for allowance over the Zait '684 patent.

<u>Claims are patentable over Zait et al. in view of Jakobsson et al.</u>:

Claims 3-6, 8-9, and 11-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Zait et al. in view of U.S. Patent No. 6,965,891 to Jakobsson et al. ("the Jakobsson '891 patent").

Although applicant does not agree that the combination of the Zait '684 patent and the Jakobsson '891 patent teaches or fairly suggests the recited features of claims 3-6, 8-9, and 11-12, it is respectfully submitted that the subject claims are patentable over the Zait '684 patent in view of the Jakobsson '891 patent by reason of depending from claim 1, as amended, and are in condition for allowance.

<u>Claims are patentable over Zait et al. in view of Jakobsson et al. and Antoshenkov</u>:

Claims 7 and 10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Zait et al. in view of Jakobsson et al. and further in view of U.S. Patent No. 5,664,172 to Antoshenkov ("the Antoshenkov '172 patent").

Although applicant does not agree that the combination of the Zait '684 patent, the Jakobsson '891 patent and the Antoshenkov '172 patent teaches or fairly suggests the recited features of claims 7 and 10, it is respectfully submitted that the subject claims are patentable over the Zait '684 patent in view of the Jakobsson '891 patent, and further in view of the Antoshenkov '172 patent by reason of depending from claim 1, as amended, and are in condition for allowance.

<u>Claims are patentable over Zait et al. in view of Hallmark et al.</u>:

Claims 13, 17, and 19-20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Zait et al. in view of U.S. Patent No. 6,014,656 to Hallmark et al. ("the Hallmark '656 patent").

With reference to claim 13, as previously described with reference to independent claim 1, applicant submits that the Zait '684 patent does not teach the feature of a fragmentation dimension basis function as recited in amended claim 1 from which claim 13 depends. Applicant therefore submits that dependent claim 13 is patentable over the Zait '684 patent in view of the Hallmark '656 patent and in condition for allowance.

With reference to claim 17, as previously described with reference to independent claim 14, applicant submits that the Zait '684 patent does not teach the feature of a fragmentation dimension basis function as recited in amended claim 14 from which claim 17 depends. Applicant therefore submits that dependent claim 17 is patentable over the Zait '684 patent in view of the Hallmark '656 patent and in condition for allowance.

With reference to independent claim 19, the subject claim, as amended, recites a limitation for "program code for constructing a fragmented database having a fragmentation scheme constructed using fragmentation dimension basis functions, each fragmentation dimension basis function configured to compute a value based upon at least one database field" and a limitation for "program code for inserting a new record into the fragmented database, the inserting including (i) computing values of the fragmentation dimension basis functions using the at least one database field of the new record, (ii) selecting a target database fragment based on the fragmentation scheme and the computed values of the fragmentation dimension basis functions, and (iii) inserting the new record into the target database fragment." Each of the recited limitations recites fragmentation based on computed values of fragmentation dimension basis functions similar to the above-described features of independent claim 1. This method of fragmentation is neither taught nor fairly suggested by the range-based and

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hash-based fragmentation schemes described in the Zait '684 patent. In other words, the fragmentation scheme recited in claim 19, as amended, determines fragments based on the range of computed output values of a basis function rather than on the range of values of the database field itself as described in the Zait '684 patent. As previously discussed with reference to claims 1 and 14, the Zait '684 patent appears not to discuss any functions other than hash functions which are unlike the basis functions described in the present application.

Thus, for at least the above reasons, it is respectfully submitted that independent claim 19, as amended, and claim 20 dependent therefrom, are patentably distinct over the Zait '684 patent in view of the Hallmark '656 patent and are in condition for allowance.

REQUEST FOR INTERVIEW

Applicant respectfully requests that the Examiner grant an interview with applicant's representative identified below in order to best expedite prosecution of this application in the event that any formal or informal matters remain after the instant Amendment is entered into the record and considered.

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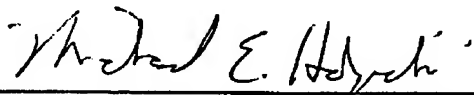**MAY 2 3 2007**

CONCLUSION

In view of the above comments and arguments presented, applicant respectfully submits that all pending claims (claims 1-20) are patentably distinct and unobvious over the art of record.

Allowance of all pending claims and early notice to that effect is respectfully requested.
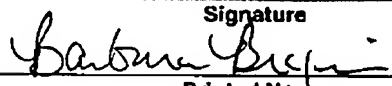
Respectfully submitted,

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23 MAY 07

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CERTIFICATE OF MAILING OR TRANSMISSION

Under 37 C.F.R. § 1.8, I certify that this Amendment is being

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